

Studies on Victorian bryophytes 8: The genus *Treubia* Goebel

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Abstract

The liverwort genus *Treubia* Goebel is represented in Victoria by a single species, *Treubia tasmanica* R.M.Schust & G.A.M.Scott. This species is described and illustrated, and its distribution and conservation status in Australia are discussed. *T. lacunosa* (Colenso) Prosk. is discounted from the Victorian flora. (*The Victorian Naturalist* 125 (2), 2008, 36–38)

Introduction

The genus *Treubia* Goebel at present comprises seven species, of which five are confined to the cool temperate regions of Australia, New Zealand and South America: *T. lacunosa* (Colenso) Prosk. (Tas, NZ), *T. lacmosoides* Pfeiffer *et al.* (NZ), *T. pygmaea* R.M.Schust. (NZ), *T. scapanioides* R.M.Schust. (Chile), and *T. tasmanica* R.M.Schust & G.A.M.Scott (Tas, Vic, NZ). Renner (2006) has suggested that another (perhaps undescribed) species may be present in New Zealand. Two other species are known, both from the tropics: *T. insignis* Goebel from Indonesia, Melanesia and Oceania, and *T. tahitensis* (Nadeaud) Goebel from Tahiti.

The genus is part of the ancient tribe Treubiopsida, which is of considerable interest to molecular biologists attempting to piece together relationships within the Marchantiophyta. The only other genus in the tribe is *Apotreubia* Hatt. *et al.*, comprising *A. hortonae* R.M.Schust. & Konstantinova from western North America, *A. nana* (Hatt. & Inoue) Hatt. *et al.* from eastern Asia, *A. pusilla* (R.M.Schust.) Grolle from New Guinea and *A. yunnanensis* Higuchi from China. *Apotreubia* differs from *Treubia* principally in having (a) terminal rather than lateral-intercalary branching, and (b) the male and female organs scattered over the dorsal surface of the midrib rather than in the axils of the lobules (Schuster and Konstantinova 1995).

In the course of this study all *Treubia* specimens from Victoria held in Australian herbaria were found to be *T. tasmanica*. *T. lacunosa*, which occurs in Tasmania and New Zealand (Glenny 1998) and had been

reported from Victoria (McCarthy 2003), is thus discounted from the Victorian flora.

Similar taxa

Because of their fleshy nature, vivid colour and obvious dorsal lobes on the leaves, *Treubia* plants are easily differentiated from other liverworts. However, the species can be hard to tell apart. Only *T. lacunosa* and *T. tasmanica* have been reported from Australia (McCarthy 2003). *T. lacunosa* can be distinguished by the cells that contain oil bodies, which are much larger than the adjacent cells and somewhat yellowish in life, giving the surface a distinctly speckled appearance.

Description

The following description is based on living plants seen in Tasmania and Victoria. Dried specimens take a very long time to rehydrate and often do not regain their original form.

Treubia tasmanica R.M.Schust. & G.A.M.Scott, *Journal of the Hattori Botanical Laboratory* 32: 248 (1969)

Plants thallose, green to lime green, in small pure colonies or creeping among other bryophytes, fleshy and rather brittle, anchored to the substrate by many rhizoids, colourless mucilage commonly present on ventral side. **Branching** infrequent, lateral-intercalary. **Shoots** 15 mm or more long, each branch up to 9 mm wide. **Thallus** with large lateral and small dorsal lobes; lateral lobes leaf-like, alternating along the axis of the thallus, spreading widely from the axis and overlapping succubously; dorsal lobes also alternating along the stem, much smaller and scale-

like, forming two distinct rows standing sharply up from the axis. **Gemmae** frequent in the axils of the dorsal lobes, pyriform, yellow-green, often with a colourless stalk. **Cells** \pm isodiametric and uniform in size, typically 35–45 μ m wide in mid-thallus, slightly smaller towards the margins. **Oil bodies** present in most cells of dorsal surface, 1–2 per cell, large, irregularly ellipsoid to globular, coarsely granular, opaque, pale brownish-grey, not persisting in dried specimens. **Rhizoids** unicellular, on ventral part of axis only. **Calyptra** \pm globular, c. 2 mm in diameter, with a speckled appearance caused by cells containing oil-bodies. Mature calyptra up to 10 mm long (Fig. 1).

Type: Tasmania. Near Camp Creek, along Lyell Hwy, west of Derwent Bridge, Surprise Valley, on slopes of Mt Arrowsmith. R.M. Schuster 50376.

Known distribution: Tasmania, Victoria, New Zealand (Fig. 2).

Habitat: On damp or wet soil or rock in humid sites in wet forest and rainforest, usually associated with streams.

Notes: The family Treubiaceae is of considerable scientific interest because it is

thought to represent an intermediate evolutionary stage between thalloid and leafy liverworts. The lateral lobes are considered by some to be leafy appendages, and by others as extensions of the axis of the thallus. Also of note is the dimorphism of the cells (ordinary vegetative cells and cells containing oil bodies) and the ability of the ventral region of the thallus to secrete copious amounts of mucilage that binds the thallus to the substratum.

The major distinction between *T. tasmanica* and *T. lacunosa* lies in the nature of the cells that contain oil bodies, as seen in the following key:

Fewer than 40% of cells in lobe bearing oil bodies; these cells sharply distinct in size, typically 2–4 times the diameter of adjacent cells, the oil body filling the lumen.....*T. lacunosa*
Fewer than 40% of cells in lobe bearing oil bodies; these cells not sharply distinct in size, up to 1.5 times the diameter of adjacent cells, the oil body often much smaller than the lumen.....*T. tasmanica*



Fig. 1. *Treubia tasmanica*. Photo by Bruce Fuhrer.

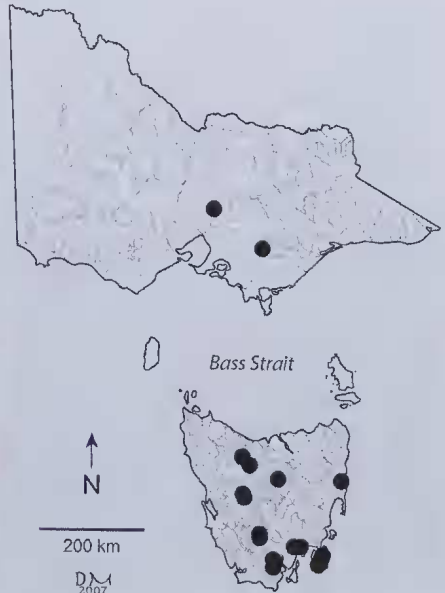


Fig. 2. Known distribution of *Treubia tasmanica* in Australia.

Conservation status

Treubia tasmanica is known from numerous sites in Tasmania, many of which are in permanent conservation reserves. Scott (1985) also reported *Treubia tasmanica* from two localities in Victoria, 'near Kinglake and Mt Baw Baw'. The collection from the Kinglake locality (1972) is in MELU, annotated 'road cutting, Kinglake–Yea Road'. Despite several searches over the last 10 years no-one has been able to relocate this site, and there seems to be no place along that road suitable for *Treubia* today. However, the presence of a population on a road cutting suggests there might be a population in the area from which spores could disperse occasionally. The collection from the Mt Baw Baw locality (1975) is in MELU (Melbourne University Herbarium) with duplicates in MEL (National Herbarium of Victoria) and HO (Tasmanian Herbarium), annotated 'road below Gantry Creek, Mt Baw Baw'. Searches of this locality (the correct name is Charity Creek) have failed to find the species, and it seems likely that a realignment of the road and other disturbances may have destroyed the population.

A few small populations were found recently on the West Tyers River, one of which is within Special Protection Zone 481/01 in Tanjil State Forest (DSE 2004), about 4 km from the Charity Creek site. A major new forestry road has been constructed recently through this SPZ, and a large section of the river bank close to the site has collapsed. The spread of blackberries and other weeds along the new road and into the river at this site, as well as rubbish dumping, trampling by visitors, and the risk of myrtle wilt and wildfire, could affect the viability of the population. The other populations are also in State Forest but outside the Special Protection Zone. Myrtle wilt is present at one site (pers. obs.), and wildfire is a constant threat. Substantial efforts were made in 2006 and 2007 to locate other populations in other parts of this catchment, but none was found.

Under the existing IUCN guidelines for assessing the conservation status of bryophytes (Hallingbeck *et al.* 2000), *Treubia tasmanica* should be classified as 'EN – endangered' in Victoria (satisfying criteria B, C2 and D) but 'LR (lc) – Lower Risk (least concern)' in Tasmania and Australia.

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